Work Zone Management
L01 e-Tool Demo
Introduction

• This e-tool is based on research conducted in SHRP2: Integrating Business Processes to Improve Travel Time Reliability (L01)

• The e-tool is designed to assist agencies in identifying their business processes that effect travel time reliability

• Reliability is dependent on many agencies and processes

• Opportunities exist to reduce the impact of congestion triggers
Introduction

• **Process** – A series of actions or activities that result in a specific or desired outcome to accomplish a specific goal
  – The method by which an incident is detected (911 call, service patrol call, etc.)

• **Business Process Mapping**
  – Provides a visual representation of steps and connections
  – Identifies areas for improvement
  – Highlights resource needs
  – Identifies additional support needs
The e-tool can be used to assess business processes for the following operational areas:

- Incident management
- Work zones
- Planned special events
- Weather/road weather management
- Traffic control/traffic operations
- Capacity/recurring congestion
- Fluctuations in demand
Intended Use of e-tool

Includes an orientation and an application module

• **Orientation module:**
  – Provides background
  – Introduces case studies

• **Application module:**
  – Intended for use in a group setting
  – Ideally, the orientation module has already been completed
STEP 1
IDENTIFYING INFLUENCES
Identifying Influences

What made it apparent that there is a need to improve a business process in order to improve travel time reliability?

TOP DOWN

EVENT DRIVEN

NEEDS BASED
Top Down

- Also known as “big directive”
- Legislative requirement or management – level directive
- Washington State DOT (WSDOT) Joint Operations Policy Statement and Instant Tow Program
  - Directive came from the governor’s office
  - Work closely with the Washington State Patrol
Event Driven

• Caused by a specific event or hazard, like an accident

• North Carolina Department of Transportation (DOT) Safety and Operations Committee
  
  – Fatality that occurred within a construction project work zone
  
  – There was a need to ensure safety of both workers and travelers
Needs Based

• Also known as “opportunity based”
• Evolves over time according to recurring needs
• Influences day-to-day operations
• Florida DOT Road Ranger Program
  – Need to assist distressed vehicles
  – Initially implemented to assist with work zones, later expanded to assist stranded motorists
STEP 2 DEFINING THE SPECIFIC RELIABILITY GOAL
Defining the Specific Reliability Goal

• Used to measure success
• Focuses your efforts
• Assists in the development of benchmarks
  – Reducing incident clearance time
  – Providing 24/7 operations
  – Improving resource efficiency
  – Reducing congestion
  – Reducing delays
• NCDOT’s goal is to mitigate work zone effects on travel time reliability.

• Need to evaluate modifications caused by work zones to minimize impacts on mobility, safety, and travel time reliability.
STEP 3 IDENTIFYING AND DOCUMENTING CURRENT BUSINESS PROCESSES
Identifying and Documenting Business Processes

• A business process:
  – Defines a series of actions or activities that result in a specific or desired outcome to accomplish a specific organizational goal
  – Is most likely something your agency does on a daily basis

• The purpose is to formally document the business process associated with one of the operational areas
Benefits

– Better understanding of the business process
– Identifying gaps in communications or data flows
– Identifying missing stakeholders
– Formalizing roles and responsibilities to ensure continuity and retaining institutional knowledge
Identifying and Documenting Business Processes

- Demonstrate multiple methods by which a visual representation of an agency’s business process can be developed

- No method is better than another

- Users are referred to the final reports of SHRP2 *Integrating Business Processes to Improve Travel Time Reliability (L01)* for additional information
Start with the basics:

- Which agencies or organizations are key to a successful implementation?
- The NCDOT Safety and Traffic Operations Committee has the following stakeholders:
  - NCDOT
  - Public safety agencies
  - North Carolina State Highway Patrol
  - Public information representatives
  - Work zone workers
  - Motorists
Identifying and Documenting Business Processes

• **Gather all documentation for your management program:**
  – Standard Operating Procedures
  – Formal Memorandums of Understanding
  – Informal exchanges of information and data
  – Current management methods
  – Others

• **Next, document the process or reverse engineer the current management process**
  • Data flows
  • Decision points
  • Process integration points
  • Critical input and output
  • Responsible entities
  • Integration of processes
• Next, create a visual representation of the operations process
• There are several approaches to mapping business processes
• In some cases, a sketch may be sufficient
• In other cases, a more comprehensive and complex drawing may be required
NCDOT Safety and Traffic Operations Committee is responsible for managing and monitoring work zones, including the following tasks:

- Monitor and evaluate work zone effectiveness and safety
- Conduct speed or safety studies to validate concerns
- Consider work zone impacts on surrounding network
- Efficiently plan for and minimize those impacts
- Carefully consider closures
- Recommend modifications or improvements to handle the additional traffic from the work zone
Business process modeling is more formal than the previous flow chart.

Makes connection between:
- Those who create the process
- Those who implement the process
- Those who perform the process

Business Process Modeling Notation (BPMN) is detailed in L01 Report.
STEP 4 DEVELOPING/CHANGING AND IMPLEMENTING PROCESS
Developing/Changing and Implementing Process

STEP 4: IMPLEMENT PROCESS

STEP 4: DEVELOP/CHANGE PROCESS

STEP 5: ASSESS PROCESS
Develop/Change Process

• Utilize map from Step 3 and influences described in Step 1
• Change business process to reflect changes in:
  – Policy
  – Procedures
  – Decisions made by the group
• **Timeframe for moving forward to implementation**
  – Depends on agency’s ability to develop/change the current business process
  – Unique for each agency and each situation
  – Formal or informal in nature
Implement Process

• The approach to this step varies
  – Number of agencies involved
  – Depth of process

• Be sure to involve all stakeholders
  – Office managers
  – Operators
  – Field workers

• Timeframe for moving forward to Step 5
  – Needs to be sufficient to allow for stabilization of new process
  – Each iteration of implementation of refined process may reduce time
Committee meets to evaluate the impact of work zones on traffic

Attempt to minimize incidents by carefully establishing appropriate speed limits

Involves coordination and integration with NCDOT Division Office; NCDOT WZTC Section; NCSHP; NC’s Information Management Public Affairs, Construction and Traffic Control (IMPACT) group, and contractors
STEP 5
ASSESSING THE PROCESS
Assessing the Process

Important to determine the effectiveness of the newly developed process.
Assessing the Process

• **Necessary Information:**
  – Measure of success
  – Method of continuous evaluation
  – Necessary data

• **Benefits:**
  – Better communication with senior managers and the public
  – Ongoing performance measurement
  – Measurement against pre-implementation conditions
Committee is focused on continually monitoring the effect of a work zone on the roadway capacity.

Continually monitor effectiveness of strategies to ensure there are no negative impacts.

Performance measures, such as speed and crash rates, are used to continually evaluate the safety and mobility.

Strategies to offset negative impacts on travel time reliability have proven successful.
STEP 6 DOCUMENTING THE PROCESS
Documenting the Process

- Occurs once the new process has been implemented and proven effective

- **Includes:**
  - Details of new business process
  - Details of evaluation process
  - Benefits
  - Lessons learned
  - Roles and responsibilities of stakeholders
Documenting the Process

- Helps to demonstrate performance
- Facilitate easier updates
- **Example of documentation**
  - Internal memorandums
  - Informal memorandums of understanding
  - User guides
  - Agreements between stakeholders
- **Other types**
  - Evaluation meetings
  - Reports
  - Flowcharts
• Traffic management plans for every construction project on NCDOT roadways

• New plans developed for every modification

• Incident clearance requirement with specifically identified towing companies for each project
STEP 7

INSTITUTIONALIZING THE PROCESS
Institutionalizing the Process

- The way in which a new or changed process is incorporated into existing policies or management programs
- Starts at the higher levels
- Important to link to firmly established agency goals
• **Stakeholder buy-in**
  - Requires more than adoption of operational activities or processes
  - Example, strong initial buy-in from Florida DOT and FHP for Road Ranger program was key to its continuing operations

• **Tangible results**
  - Benefits and outcomes must be tangible and directly related to each agency and operating unit
Strategies and Considerations

• Developing formal documentation that is accessible and available to everyone
  – Example, inter-agency agreement on a network directory

• Ensure documentation is sustainable
  – Documents such as MOUs that require formal approval have a better likelihood of outlasting informal agreements
Published *Guidelines for Implementation of the Work Zone Safety and Mobility Policy*

- Safety and Traffic Operations Committee determines project level of significance
- Continuous monitoring provides safer work environment and roadway